

REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1, 2, 4-8, 10, 12 and 13 are pending in the present application, Claims 1 and 7 are amended and Claims 3, 9 and 11 are cancelled by the present amendment. Support for amendments to the claims can be found in the specification as originally filed, for example, on page 11, lines 6-9. Thus, no new matter is added.

In the outstanding Office Action, Claims 1-13 was rejected under 35 U.S.C. §102(e) as anticipated by Livesay et al. (U.S. Pat. No. 6,607,991, herein "Livesay").

Before turning to the outstanding prior art rejections, it is believed that a brief review of the present invention would be helpful.

In this regard, the claimed invention is directed to an electron beam processing method and apparatus for processing an organic material film formed on a surface of an object to be processed using an electron beam. In the processing method and apparatus, the electron beam is irradiated onto the organic material film through a hydrocarbon radical generating gas, e.g., a methane gas, while *a partial pressure of the hydrocarbon radical generating gas in the chamber is set to be greater than or equal to 0.1 Torr.*

Upon irradiation of the electron beam, the hydrocarbon radical generating gas is converted into a plasma and generates hydrocarbon radicals. The generated hydrocarbon radicals then suppress the release of hydrocarbon groups generated from the surface of the organic material film. Consequently, surface characteristics of the organic material film measured, e.g., a dielectric constant value, are prevented from being deteriorated.

Therefore, in the claimed invention, *the partial pressure of the hydrocarbon radical generating gas is preferably maintained at or above a certain level in the processing chamber for achieving stable performance.* If the partial pressure of the hydrocarbon radical

generating gas is too low, the electron beam is easily transmitted, and thus it becomes difficult to convert the hydrocarbon radical generating gas into a plasma to thereby generate hydrocarbon radicals. Amended independent Claim 1, and similarly amended independent Claim 7, recite an optimum range of the partial pressure of the hydrocarbon radical generating gas, i.e., greater than or equal to 0.1Torr, used to achieve stable performance.

Addressing now the rejection of Claims 1-13 under 35 U.S.C. §102(e) as anticipated by Livesay, that rejection is respectfully traversed.

Livesay describes an electron beam exposure method in which an irradiation is conducted in a vacuum of about 0.01 to about 0.08Torr, resulting in a *total pressure in the processing chamber that is lower than 0.08Torr*. Further, the partial pressure of a background gas of Livesay is expected to be even lower than 0.08Torr, clearly lower than 0.1Torr recited in the independent claims.

In addition, Livesay fails to teach how the hydrocarbon radical generating gas functions to suppress the release of the hydrocarbon groups from the surface of the organic material film. Further, Livesay provides no description or suggestion noting that the partial pressure of the hydrocarbon radical generating gas above a certain level should to be maintained to guarantee stable performance.

Accordingly, as Livesay does not describe or suggest all of the features recited in Claim 1, Applicants respectfully submit that Claim 1 and similarly Claim 7, and claims depending therefrom, patentably distinguish over Livesay.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal Allowance. A Notice of Allowance for Claims 1, 2, 4-8, 10, 12 and 13 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact Applicants' undersigned representative at the below listed telephone number.

Respectfully submitted,

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